

ArgoNeuT Update

All Experimenter's Meeting

Mitch Soderberg

10/19/2009



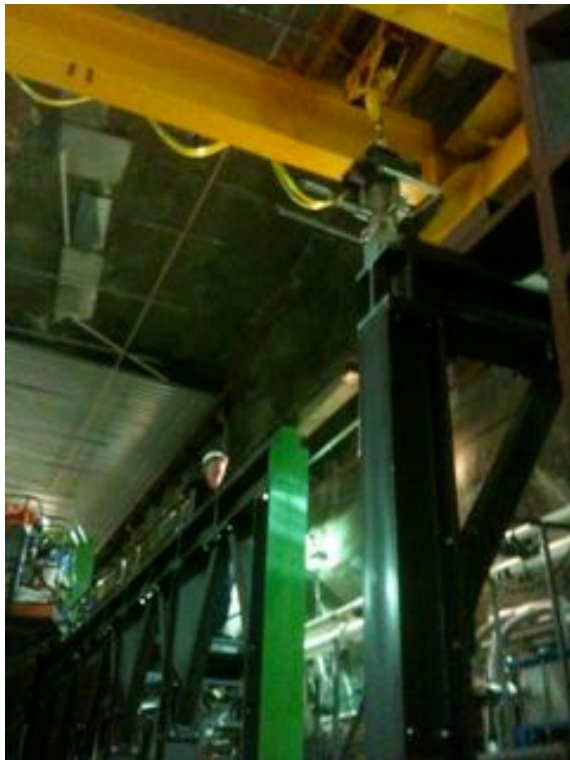
Cryo. Issues

- We developed a problem with our cryogenic system the evening of Oct. 4, 2009.
- Cryo. issues indicated a sudden drop in cooling power of our cryocooler.
- Reduced cooling power prohibits us from utilizing filters (too much of a heat load) that purify argon.
- Our cryocooler is not near it's normal maintenance period, and these are known to be very reliable.
- Suspected that either:
 - ▶ Heat-exchanger block bolted to the cold-head was no longer making proper contact.
 - ▶ Some internal mechanism of cryocooler was causing problems...
- Needed to remove the cryocooler assembly from the system in order to work on it.
- Backup cryocooler from DECAM available if necessary.



Cryocooler Testing

- We removed the cryocooler assembly Monday, Oct. 12...testing/repairs followed.
- Tested our cryocooler at Lab F on Tuesday, Oct. 13.
 - ▶ Heat exchanger looked firmly attached...left it in place for first test.
 - ▶ Took longer than expected to get cold (~2 hours vs. ~30 minutes) with basically no heat load on the cryocooler...this confirms lack of cooling power observed in the tunnel.
- Tested new DECAM cryocooler, with existing heat exchanger and improved temperature monitoring, on our system on Thursday, Oct. 15.
- ReTested DECAM cryocooler, with modified temperature monitoring, on Friday, Oct. 16. Test was good...confirmed we have at least 300W of cooling power.
- Reinstalled cryocooler assembly in the NuMI tunnel on Saturday, Oct. 17.



Removing Cryocooler



Testing at Lab F

Cryocooler Testing

- Installed brand new Indium sheet after polishing heat exchanger.
- Improved temperature monitoring by mounting RTDs on the heat exchanger.
- Added better washers to guarantee attachment of heat exchanger to cryocooler.



Test Setup



Heat Exchanger



Cryocooler w/o Exchanger

Outlook

- Cryostat was emptying last week during cryocooler work. System is now completely empty and warmed up.
- Filters are almost all regenerated.
- Vacuum pumps are being reinstalled to evacuate the cryostat before filling...plan to begin pumping Tuesday.
- Ordered new liquid argon dewars today...these will be tested for nominal purity at PAB, then sent to the NuMI tunnel.
- Hope to refill later this week.
- Problematic cryocooler sent back to Cryomech for further investigation.